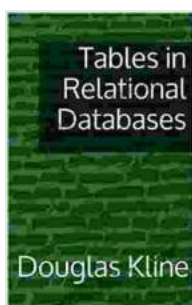# Tables In Relational Databases: An Introduction to Relational Database Design

Relational databases are a powerful tool for storing and managing data. They are used in a wide variety of applications, from small business accounting systems to large enterprise data warehouses. The foundation of a relational database is the table. Tables are used to store data in a structured way, and they can be related to each other to create complex data models.

In this article, we will provide you with a comprehensive to tables in relational databases. We will cover the basics of tables, including their structure, components, and relationships. You will also learn how to create, modify, and delete tables, as well as how to insert, update, and delete data from tables.

A table is a collection of data that is organized into rows and columns. Each row in a table represents a single record, and each column represents a different field or attribute of the record. For example, a table of customer data might have columns for customer name, customer address, and customer phone number.

**Tables in Relational Databases (Introduction to Relational Databases Book 2)** by Sarah Taylor

★★★★☆ 4 out of 5

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| Language | : English |
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| Print length | : 12 pages |

The structure of a table is defined by its schema. The schema specifies the name of the table, the names of the columns in the table, and the data type of each column. For example, the following schema defines a table named "customers":

CREATE TABLE customers ( customer_id INT NOT NULL AUTO_INCREMENT, customer_name VARCHAR(255) NOT NULL, customer_address VARCHAR(255) NOT NULL, customer_phone VARCHAR(255) NOT NULL );

The `customer_id` column is the primary key of the table. This means that it is a unique identifier for each record in the table. The `customer_name`, `customer_address`, and `customer_phone` columns are all non-null columns, which means that they cannot contain null values.

Tables are made up of several different components, including:

- **Rows:** Rows are the horizontal units of data in a table. Each row represents a single record.

- **Columns:** Columns are the vertical units of data in a table. Each column represents a different field or attribute of the record.

- **Cells:** Cells are the individual units of data in a table. A cell is the intersection of a row and a column.

- **Primary key:** The primary key is a unique identifier for each record in a table.

- **Foreign key:** A foreign key is a column that references a primary key in another table.

Tables can be related to each other in a variety of ways. The most common types of relationships are:

- **One-to-one:** A one-to-one relationship is a relationship in which each record in one table is related to only one record in another table. For example, a table of customers might have a one-to-one relationship with a table of Free Downloads, where each customer can only place one Free Download.

- **One-to-many:** A one-to-many relationship is a relationship in which each record in one table is related to multiple records in another table. For example, a table of customers might have a one-to-many relationship with a table of Free Downloads, where each customer can place multiple Free Downloads.

- **Many-to-many:** A many-to-many relationship is a relationship in which each record in one table is related to multiple records in another table, and each record in the other table is related to multiple records in the first table. For example, a table of customers might have a many-to-many relationship with a table of products, where each customer can Free Download multiple products and each product can be Free Downloadd by multiple customers.

Relationships between tables are defined using foreign keys. A foreign key is a column in one table that references a primary key in another table. For

example, the following foreign key in the `Free Downloads` table references the `customer_id` primary key in the `customers` table:

ALTER TABLE Free Downloads ADD COLUMN customer_id INT NOT NULL REFERENCES customers(customer_id);

Tables can be created using the `CREATE TABLE` statement. The `CREATE TABLE` statement specifies the name of the table, the names of the columns in the table, and the data type of each column. For example, the following statement creates a table named "customers":

CREATE TABLE customers ( customer_id INT NOT NULL AUTO_INCREMENT, customer_name VARCHAR(255) NOT NULL, customer_address VARCHAR(255) NOT NULL, customer_phone VARCHAR(255) NOT NULL );

The `AUTO_INCREMENT` keyword specifies that the `customer_id` column will be automatically incremented for each new record that is inserted into the table.

Tables can be modified using the `ALTER TABLE` statement. The `ALTER TABLE` statement can be used to add new columns, drop existing columns, or change the data type of a column. For example, the following statement adds a new column named "customer_email" to the `customers` table:
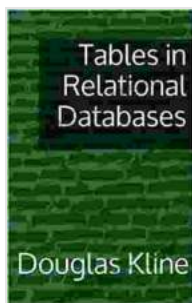
ALTER TABLE customers ADD COLUMN customer_email VARCHAR(255) NOT NULL;

Tables can be deleted using the `DROP TABLE` statement. The `DROP TABLE` statement removes the table from the database. For example, the

following statement drops the `customers` table:

DROP TABLE customers;

```
<h2>Inserting Data Into Tables</h2> Data can be inserted into tables
```

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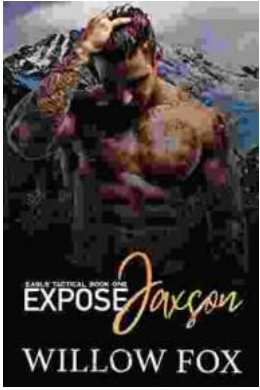
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